Asset Management Paser Data Collection – Roadsoft and Laptop Data Collector (LDC)

The Asset Management Paser Data Collection effort can be conducted using the combination of RoadSoft GIS for database management and the Laptop Data Collector for field collection. Both of these products are produced and supported by the Technology Development Group at Michigan Technological University. This section will give a basic overview of these two software packages as they relate to this Data Collection Effort. There are dozens of functions in the RoadSoft GIS and Laptop Data Collector that are not covered in this documentation since they are not relevant to this study. For complete training on RoadSoft contact LTAP at (906)487-2102 or check their website at www.roadsoft.org. RoadSoft GIS and the Laptop Data Collector are county-based GIS products. Data collection in more than one county will require installation of multiple copies of both RoadSoft GIS and the Laptop Data Collector on your computer.

New RoadSoft GIS and Laptop Data Collector Users
RoadSoft GIS Installation
To start the installation of RoadSoft GIS insert the RoadSoft GIS CD for the appropriate county in the CD(/DVD) Drive on the computer. Click Start|Run browse to the CD Drive and click on Setup.exe, click Open and then OK. This will start the installation program.

Installation Options Dialog Box
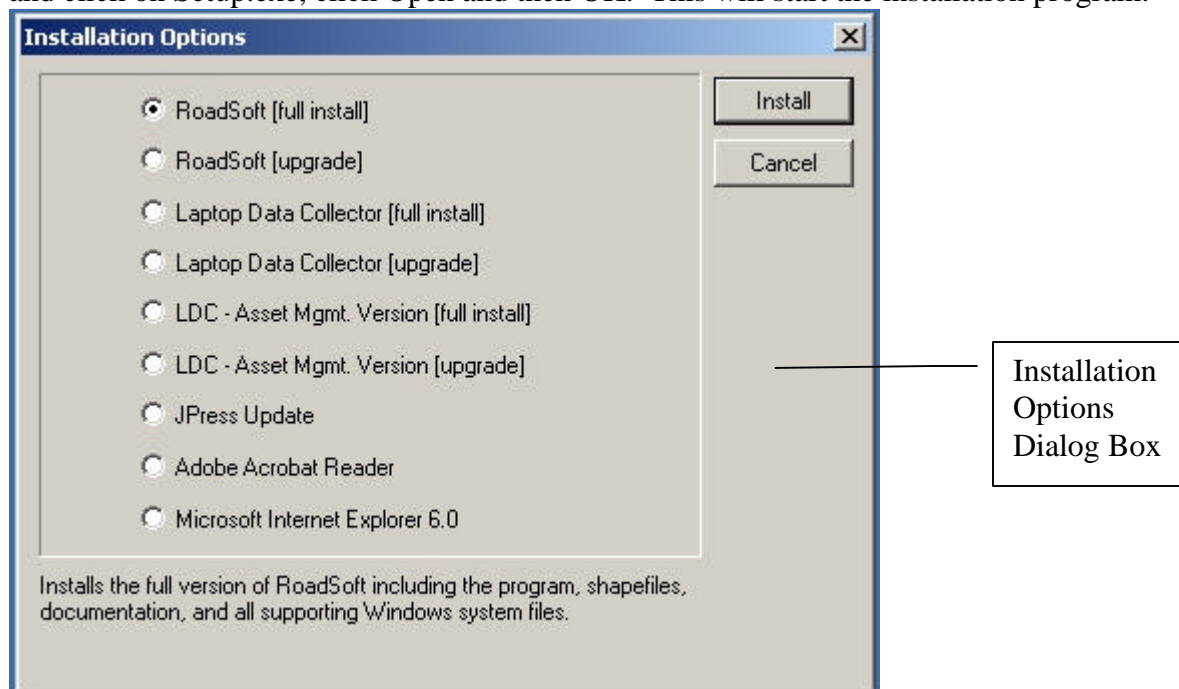
The Installation Options dialog box will appear asking which software to install. Click on RoadSoft (full install) and then the install button. The next screen is a welcome screen, click Next, you will then be prompted for the destination of the installation. The default directory is C:\Program Files\RoadSoft, in most cases, this is fine. If you have a previous version of RoadSoft GIS installed or a different county, you will need to change this directory. The next prompt is for installation type. From the list choose Stand-Alone Version (default), click Next. The next screen is a confirmation of the previously

supplied data: click Next and the installation begins. When the installation is completed, you will be prompted to reboot you computer.

<u>Laptop Data Collector Installation</u>
To start the installation of the Laptop Data Collector, insert the RoadSoft CD for the appropriate county into the CD(/DVD) Drive on the laptop computer. Click Start|Run, browse to the CD Drive and click on Setup.exe, click Open and then OK. This will start the installation program. The Installation Options dialog box will appear asking which software to install click on LDC – Asset Mgmt. Version (full install) and then the install button. The next screen is a welcome screen, click Next, you will then be prompted for which Group to add the Laptop Data Collector, the default is RoadSoft. Next, you will be prompted for the destination of the installation. The default directory is C:\Program Files\RSLDC; in most cases, this is fine. If you have a previous version of the Laptop Data Collector installed or a different county, you will need to change this directory. Click Next and the installation will begin. Once it is complete click OK.

<u>RoadSoft GIS First Run</u>
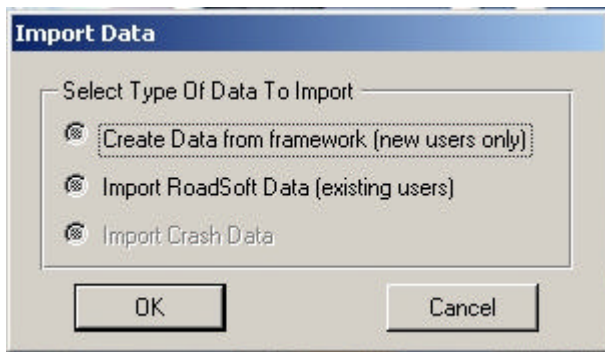
With the first run of RoadSoft GIS, you will be prompted to import data. To do this, click on Create Data from framework (new users only). Click OK, you will receive a warning message that "This operation will replace existing database tables": click OK. RoadSoft GIS will start creating the framework tables. Depending on the size of your area, this could take some time (10-20 minutes for very large counties). During the process, you will be asked if you want to Import Crash Data. Click No and the database processing will finish.

If existing RoadSoft data needs to be imported click on the Import RoadSoft Data (existing users) and click OK. The program will then allow you to browse to the directory where your previous RoadSoft data can be found. This process will take some time depending on the size of your area and the amount of data to be import.

All RoadSoft GIS and Laptop Data Collector Users
<u>RoadSoft GIS Basics</u>
Map toolbar (going left to right)

Select – Select one link at a time, add to the selection by Shift+click, remove from the selection by Ctrl+click.

Spatial Select – Select several links by dragging a circle or rectangle, all links enclosed by the shape will be selected. Add to the selection by Shift+click, remove from the selection by Ctrl+click.

Identify – Get Inventory and RSM information about a single link.

Pan – Grab the map and move it within the map window.

Zoom In – Drag a rectangle and zoom in on the enclosed area.

Zoom Out – Click on the screen to zoom out. The click location becomes the center of the map.

Label – Click on a link to add a Roadname label.

Remove Label – Click on a link to remove a Roadname label.

Clear Selection – Remove all links from the selection.

Clear All Labels – Remove all the labels on the map.

Zoom to Selection – Zoom to fit selection on screen.

Zoom to Township – Select a Township from the list and zoom to it on the map.

Zoom to Full Extent – Show the entire county map.

Network Options – Open Network Builder or Apply Saved Network (if you have a current selection: Save Selected As Network and Clear Network are also available).

Network Building and Laptop Utilities
Before data collection can begin, you need to create a network and export it to the Laptop Data Collector. RoadSoft GIS uses a "Library System" where data must be "checked-out" from RoadSoft GIS before it can be used in the Laptop Data Collector. While the data is "checked-out" no modifications to the checked-out can be made in the RoadSoft GIS. Changes can only occur to those links in the Laptop Data Collector.

Network Building
There are several methods to build networks:
1) Create a selection, using the Select and/or the Spatial Select tools, click on Network Options and then Save Selected As Network. You will be prompted for a name for the network.
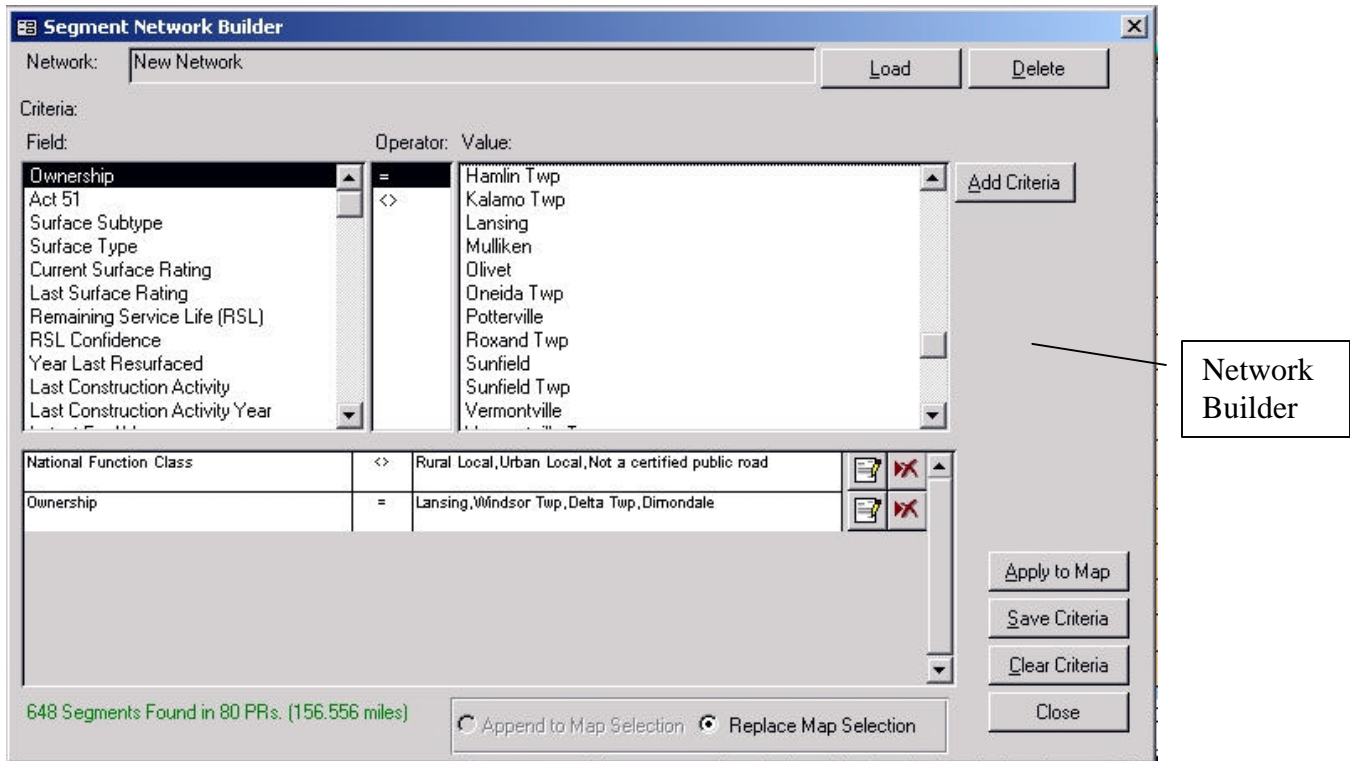
Network Builder

2) Open the Network Builder by clicking on Network Options and then Open Network Builder or by selecting Tools|Network Builder from the menu bar. The Network Builder allows you to create a network by query, using one or several fields from the database or any previously saved network (network is available at the bottom of the field list). The queries are built in four steps: Select the Field, an Operator, and a Value (more then one value can be used by Shift+Click and/or Ctrl+Click) then click the Add Criteria button. You can add other fields to the query by repeating this process to refine the network. With each criteria added to the query the number of segments, the number of PRs, and the miles of road selected are displayed. To delete a criteria, click on the red X by that criteria. You can click the Apply to Map button to see the results of your query at any time. When you have the rating network defined, click on the Save Criteria button, the network will automatically be applied to the map. You will be prompted for a name for the network. Give the network a name and click OK to continue.

Laptop Utilities

Export
Laptop
Data
Screen
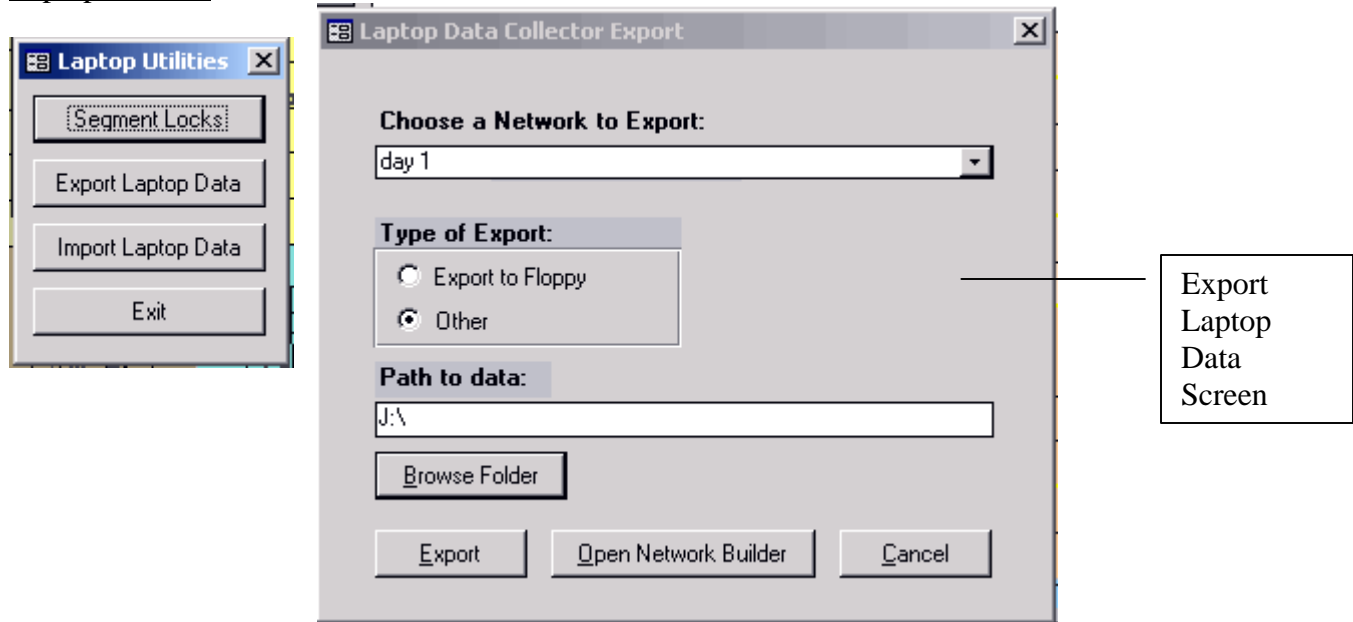
Now that we have defined a network, you can export it for use in the Laptop Data
Collector. There are several methods of transferring data from RoadSoft to the Laptop
Data Collector which include but are not limited to floppy disc, networks, RAM drives,
etc… we will describe the process for floppy disc but all methods are similar. Before you
can export, you will need at least one **blank formatted** floppy disc (depending on the
size of the network, you may need more). To export the network click Utilities|Laptop
Utilities. This will bring up the dialog box (above left). Click the Export Laptop Data
button. A new window (above right) will appear asking you to Choose a Network to
Export. Select a network from the list or create a new network by clicking on the Open
Network Builder Button. The Type of Export is Export to Floppy (most likely the floppy
drive will be A:). When you are ready to export, click the Export button. When the
export completes, it is suggested that you export the entire database to backup the current
state of the system, so if something goes wrong when we import the Laptop Data
Collector Data you will not have any data loss or have to recreate all of your work to this
point. To export the data, click on Utilities|Export RoadSoft Data; click OK and the
backup will be created. Unless otherwise specified the export will be stored in a default
directory C:\Program Files\RoadSoft\Export\year_mo_dy. A new folder with today's
date will be created (year_month_day, xxxx_xx_xx format).

You can now Exit RoadSoft GIS (File|Exit) and Start the Laptop Data Collector.

Laptop Data Collector
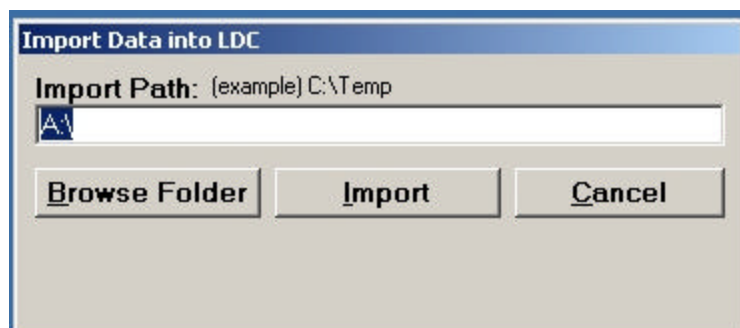
Start the Laptop Data
Collector. If this is the first
time you have run the Laptop
Data Collector you will be
prompted that it could not
find data and that it will need

to be imported (if you have run the LDC before and need to import new data click Tools|Import Data). A dialog box (left) will appear asking for the import path. Insert the floppy disc that the export was saved to in the laptop and click Import (you may receive several warnings that you can click through). When the import is complete the Laptop Data Collector will open.

The screen is separated into three main sections:
1) <u>GIS Map</u> (top right-hand side) – This map area shows the segments to be rated, segments already rated, and segments that can not be rated since they are not part of the network. This map has a subset of the functions in the RoadSoft GIS: Select, Information, Pan, Zoom In, Zoom Out, Label, Remove Label, Zoom to Selection, Zoom to GIS (new feature), Zoom to Full Extent, and Remove all Labels.

PR Tree View
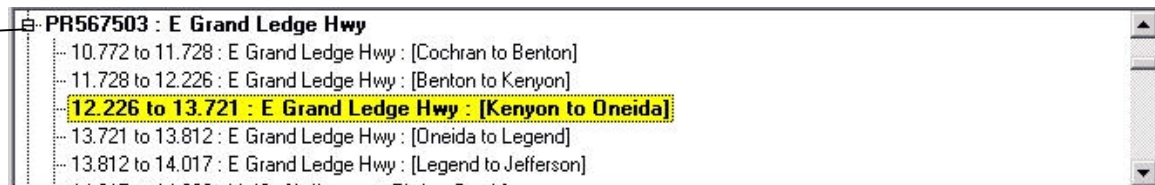
2) <u>PR Tree View</u> (bottom right-hand side) – This area shows a listing of each segment within a PR by milepoint. This area can be used to easily select segments that have been missed in the rating process.


Data Collection View
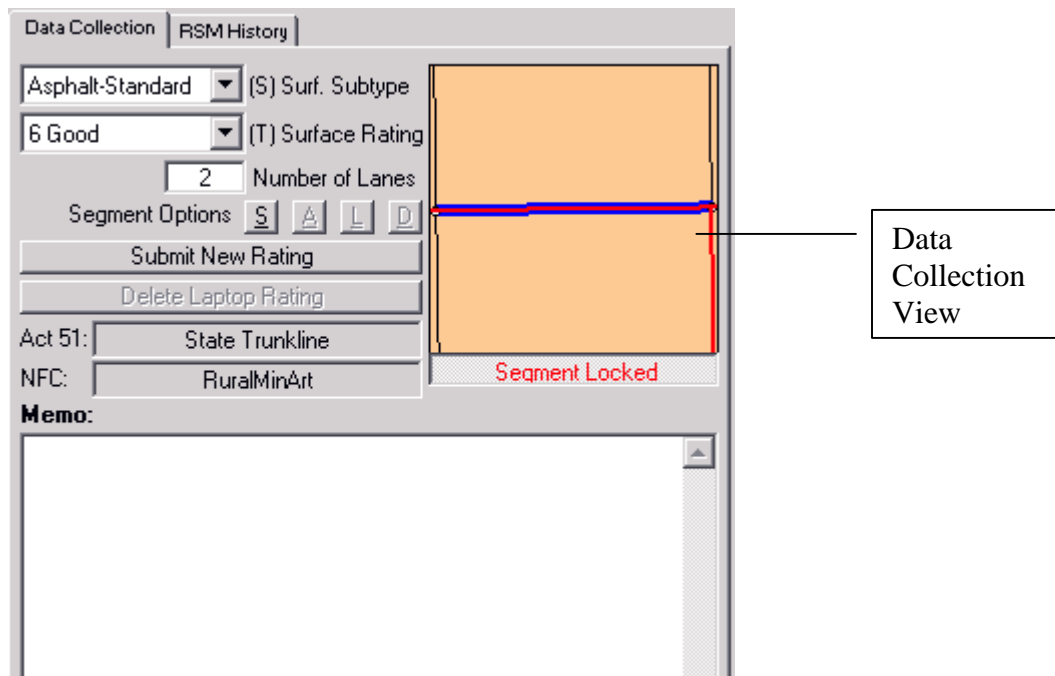
3) <u>Data Collection View</u> (left-hand side) – This area shows Surface Type, Surface Rating, Number of Lanes, and Memo. All data entry occurs in this area.

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GPS Hook-up
This section will give key information on hooking up and operating the GPS receiver. Always start the laptop and log-in to Windows before plugging in the GPS receiver to computer and the cigarette lighter (if you do not the computer may think the GPS receiver is a mouse).

1) Mount GPS receiver to roof of the vehicle
2) Bring power and serial cables through the window
3) Start the laptop and login to Windows
4) Plug the power cord into the cigarette lighter (or splitter)
5) Attach the serial cable to the serial port (to test that the GPS receiver is getting a signal you can put the receiver up to your ear and you should hear a clicking noise)
6) (Optional/Troubleshooting) Test whether the laptop is receiving the signal by click Start|Programs|Accessories|Communications|HyperTerminal this will bring up a set up screen. Give the connection a name and click OK, on the screen that follows change Connect using: to COM1 and click OK. Another screen will appear asking about COM1 properties: Bits per second: 4800 (can be upgraded to 9600, if the GPS receiver is set up to do so), Data bits: 8, Parity: None, Stop bits: 1, and Flow Control: None and click OK. If the computer is reading the GPS receiver, data will flow to the terminal area. At this point, the test is complete and you can close the terminal. If information is not flowing to the screen, check the connections to the laptop and the power cord. Also, check the GPS receiver and listen for the clicking.

From within the Laptop Data Collector
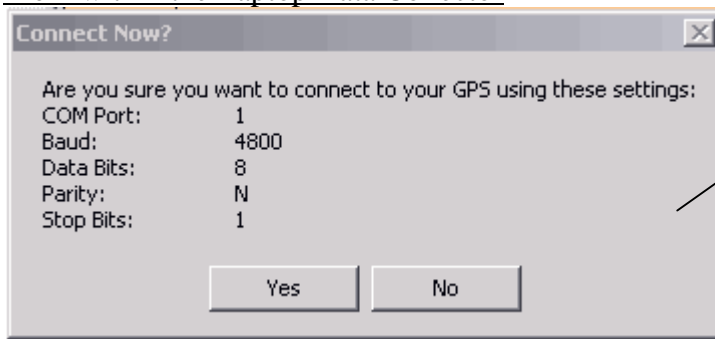
GPS Connect Confirmation Screen

7) Click Tools|GPS|Connect to GPS, a confirmation screen will appear, the following settings should be displayed:
   COM Port: 1, Baud: 4800 (unless you have been upgraded to 9600), Data Bits: 8, Parity: N, Stop bits: 1.
8) If the settings are correct click yes and the LDC will search for the GPS receiver, but if they are wrong click no (Note: to change the GPS Settings go into Tools|GPS|Change GPS Settings).

Using the Laptop Data Collector/Shortcuts
The easiest method of using the Laptop Data Collector is to use the shortcuts, since it is difficult to use a mouse in a moving vehicle. The important shortcut keys:

Ctrl+S – Surface Subtype – cycle through available types (Asphalt, Brick, Composite, Concrete, Graded Earth, Gravel, Sealcoat, and Unimproved Earth).

Ctrl+T – Surface Rating – cycle through available ratings (1-10).

Ctrl+0-9 – Surface Rating 1 – 10

Ctrl+Shift++ - Increase Surface Rating

Ctrl+Shift+- - Decrease Surface Rating

Ctrl+Shift+0-9 – Number of Lanes 1-10

Ctrl+L – Locks/Unlocks a Segment

Ctrl+Space – Locks/Unlocks a Segment

Ctrl++ - Zooms In

Ctrl+- - Zooms Out

Ctrl+Z – Zooms to the selected segment

Ctrl+Shift+Z – Zooms to the GPS point.

Ctrl+Arrow – Pans the Main Map

Alt+Arrow – Browse the treeview

Alt+S – Split the currently selected segment

Alt+G – GPS on/off

Ctrl+Enter – Saves the Pavement Data

An example of the keystrokes that could be used to rate one segment:
Ctrl+Shift+Z, Ctrl+S, Ctrl+S, Ctrl+S, Ctrl+S, Ctrl+6, Ctrl+Shift+2, Ctrl+Enter

This translates to select link using GPS, set surface type as Concrete, set surface rating to 6, set number of lanes to 2, save the pavement data.

Locking/Unlocking Segments in LDC for data entry
When no segment is locked in the map window, the GPS is in control and it will select the nearest segment. The idea of locking a segment in the LDC is to allow the user to work with a specific segment regardless of what segment the GPS is located on. The

button under the small map will display the current status of the link whether it is locked or unlocked.

To lock the current segment for data entry you can click the button under the small map or use Ctrl+L or Ctrl+Space. To lock any other segment, select the segment on the map or in the PR treeview. To unlock a segment and give control back to the GPS click the button under the small map, use Ctrl+L or Ctrl+Space.

Splitting a Segment
To split a segment in the LDC, click the Split Current Segment Button (the 'S' button found under the small map) or use the shortcut Alt+S. This will open the Split Segment dialog box.

If the GPS is connected and the current segment is not locked, the Split map will open with the split point being the GPS point on the segment. To move the split point to the current GPS point, click the 'Snap to GPS Point' button. If no GPS is connected or the current segment is locked, then the split point defaults to the middle of the segment. To modify the milepoint manually, the user can : 1) click the desired point directly in the

Split segment dialog box
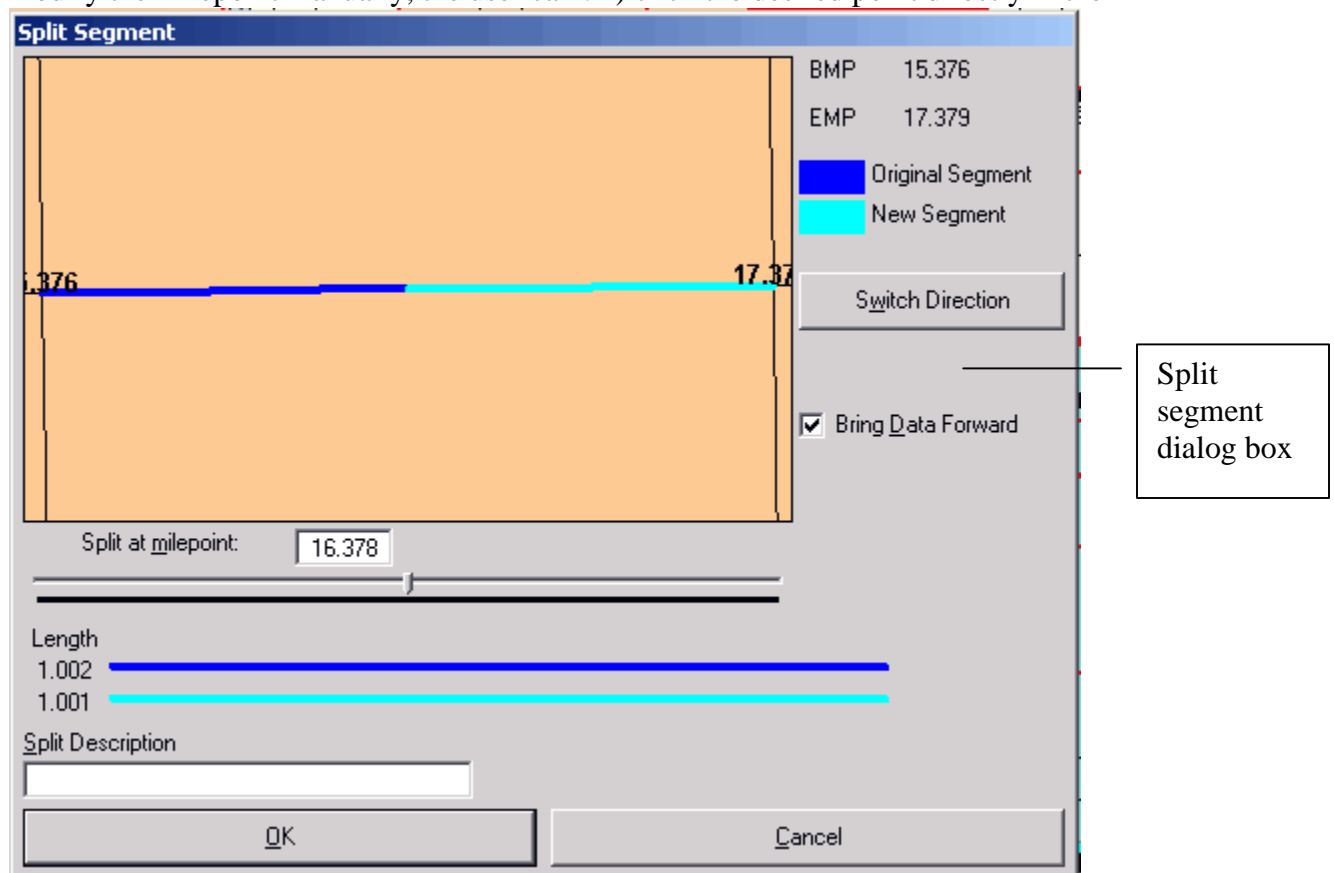
split map window, 2) move the slider to the desired point, or 3) enter the desired milepoint in the 'Split at Milepoint' textbox.

The user can enter a description in the Split Description textbox. The description will become the From Description for the new segment and the To description for the original segment.

The 'Bring Data Forward' checkbox allows the user to copy the inventory and RSM data from the original segment over to the new segment.

The 'Switch Direction' button is useful when no GPS is connected and the user is traveling on the current segment in a descending direction relative to the current segment's beginning and ending milepoints. Clicking the button will switch the new segment with the original segment.

After the details of the split are finished, click 'OK' to perform the split, the split map window will then close, and the current segment will be the new segment that was created. Clicking the 'Cancel' button will close the split map window and cancel the split operation.

Exporting from the Laptop Data Collector

Export from LDC to RoadSoft
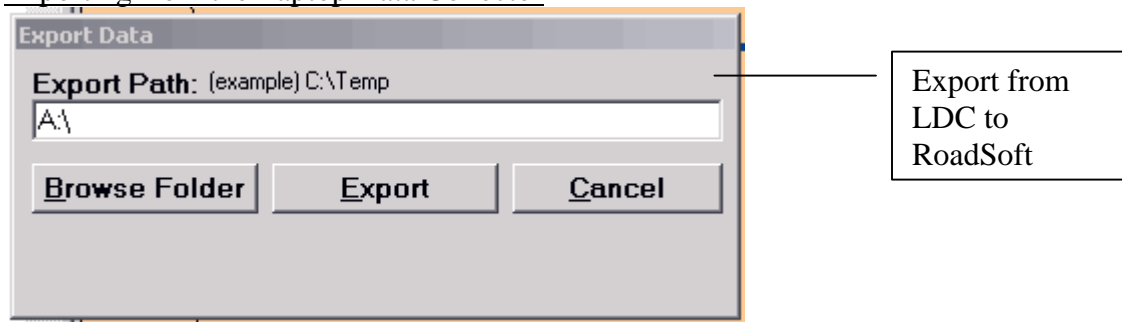
It is suggested that at breaks, lunch, and at the end of the day to export the Laptop Data Collector data to floppy so if there is a malfunction only part of a day of collection is lost. To export data you will need at least one **blank formatted** floppy disc. With the disc in the floppy drive, Click Tools|Export Data, click Export, you will get a warning message that briefly stated; if you import this data into RoadSoft you will need to create a new network for use in the Laptop Data Collector, click OK and the data will be written to the floppy.

Importing Laptop Data Collector into RoadSoft GIS

Import LDC Data into RoadSoft
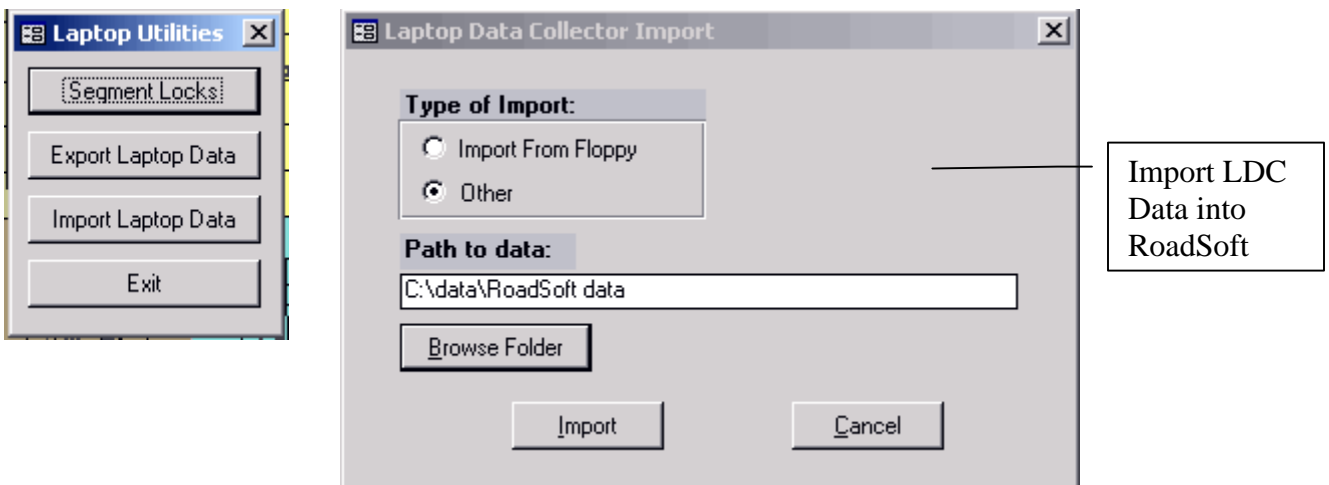
To import Laptop Data Collector data start RoadSoft GIS, Click Utilities|Laptop Utilities, this will bring up a dialog box, click on the Import Laptop Data button. You will be prompted for the type of import (Import from Floppy) and the Floppy Drive (most likely A:) click Import. You will get a warning recommending you to Export the RoadSoft GIS data before Importing the Laptop Data Collector data (if you followed the direction you have already done this) so click OK. There are two more messages that you will need to OK, then the import procedure will run, it can take several minutes to import depending on how much data was collected.

Daily Logs
You will be asked to complete a Daily Log that includes: Miles Driven, Miles Rated, Rating Team, and Location. To calculate the Miles Rated we use RoadSoft. Click on Reports|Asset Management Reports and a Report Building Dialog Box will appear.

Setup the report as shown above but change the date to the current date. Once the form is setup click Run Report and a report file will be generated for you.

Data checks
Before leaving a county several data checks should be done to ensure that data was collected for all required roads. To check the data in RoadSoft GIS you should create legends for Surface Subtype, Last Surface Rating, and Number of Lanes. The legends should help identify any links missed on these key fields. To create a legend click on the Create/Edit Legend button (the button with a hammer and wrench, next to the current

legend box). The Legend type will be Category: Color by Unique Values, Legend Field will be either Surface Subtype, Last Surface Rating, or Number of Lanes, and for the Legend Values select all values and then click the Add Values button, followed by the Apply button. The new legend should be displayed, zoom in and check for consistency and gaps in the collection.

Exporting RoadSoft GIS for inclusion in the master database
When you have finished rating all the roads in a county, city, or township, and all the data has been brought back into RoadSoft GIS and verified, you will need to export the RoadSoft GIS database. The resulting files will be sent back to Lansing to be included in the master database. To export data from within the RoadSoft GIS click on Utilities|Export RoadSoft Data. A dialog box will come up asking Type of Export pick Other, uncheck the Compressed and Include Crash Data check boxes. The default path will be C:\Program Files\RoadSoft\Export\year_mo_dy, since RoadSoft GIS automatically names the resulting files you will need to create a directory that describes the data collection location, i.e. C:\...\completed\county\Alcona or C:\...\completed\city\Ionia. RoadSoft GIS will create the new directory for you as well as a \system subdirectory. All these files and subdirectories will need to be transferred to the laptop and included on the weekly CD sent back to Lansing. You may need to use WinZip (and possibly span across multiple floppy disc) or burn a CD of the data to get it to the laptop.